

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM NO. R5-2007-xxxx
FOR
UNITED STATES AIR FORCE
BEALE AIR FORCE BASE
IN-SITU CHEMICAL OXIDATION TREATABILITY STUDY FOR REMEDIATION OF
VOLATILE ORGANIC CONSTITUENTS AT SITE 32
YUBA COUNTY

This Monitoring and Reporting Program (MRP) incorporates requirements for monitoring the progress of a full-scale in-situ chemical oxidation (ISCO) treatability study project using potassium permanganate as an oxidant to treat groundwater pollution at Site 32 at Beale Air Force Base. Waste Discharge Order R5-2007-xxxx (Order) covers the activities for Phase I and Phase II of the ISCO full-scale treatability study. This MRP may need to be updated if the Discharger violates the Order. If the Regional Board finds that the Order has been violated, the Discharger is required to implement a Contingency Plan, which includes operating an in-situ bioremediation system. The in-situ bioremediation system may include the use of sodium thiosulfate, sodium lactate, and/or emulsified oil, or cheese whey in a recirculation loop. The MRP would be revised to include additional monitoring parameters and, if necessary, additional monitoring wells to evaluate the effectiveness of corrective action. The Discharger shall not implement any changes to this MRP unless and until a revised MRP is issued by the Executive Officer.

All samples shall be representative of the volume and the nature of the discharge and matrix of the sampled medium. The time, date, and location of each grab sample shall be recorded on the sample chain of custody form.

Compliance with this Monitoring and Reporting Program, and with the companion Standard Provisions and Reporting Requirements, is ordered by Waste Discharge Requirements Order No R5-2007-XXXX. Failure to comply with this Program, or with the Standard Provisions and Reporting Requirements dated 1 March 1991, constitutes noncompliance with the WDRs and with the Water Code, which can result in further enforcement actions as allowed in the Water Code

A. REPORTING

The Discharger shall report monitoring data and information as required in this Monitoring and Reporting Program and as required in the Standard Provisions and Reporting Requirements. Reports, which do not comply with the required format will be **REJECTED** and the Discharger shall be deemed to be in noncompliance with the WDRs.

Groundwater monitoring data collected in accordance with this MRP shall be included with technical reports required by the Order. That is, available Quarterly and Semi-annual Groundwater monitoring data, shall be submitted with the **Baseline Summary**

Report, Implementation/ Phase I Report and the Phase II Evaluation Report required by Order No. R5-2007-XXXX. Thereafter, the Discharger is required to submit semi-annual groundwater monitoring reports due on 15 March and 15 September of each calendar year for a period of three years following start-up of the second phase of the treatability study. At a minimum, the reports shall include:

1. A narrative description of all preparatory, monitoring, sampling, and analytical testing activities for the groundwater monitoring. The narrative shall be sufficiently detailed to verify compliance with the WDR, this MRP, and the Standard Provisions and Reporting Requirements. The narrative shall be supported by field logs for each well documenting depth to groundwater; parameters measured before, during, and after purging; calculation of casing volume; total volume of water purged, etc.;
2. Copies of all laboratory analytical report(s);
3. Cumulative data tables containing the water quality analytical results and depth to groundwater;
4. An evaluation of the performance of the full-scale treatability study including an analysis of its effectiveness in destroying the pollutants, and a discussion of the potential for field scale application;
5. A discussion of compliance and the corrective action taken, if any, as well as any planned or proposed actions needed to bring the discharge into full compliance with the waste discharge requirements; and
6. A discussion of any data gaps, potential deficiencies/redundancies in the monitoring system or reporting program and the anticipated date for an effectiveness evaluation of the pilot study.

B. REQUIRED MONITORING REPORTS AND SUBMITTAL DATES

1. Semiannual Groundwater Monitoring Reports

All Semiannual monitoring reports shall include all water quality data and observations collected during the reporting period and submitted per the **Reporting Due Dates** in Section B.3 of this Monitoring and Reporting Program. At a minimum the sampling and data collection in Section C or Tables 1 and 2 of this Monitoring and Reporting Program and Waste Discharge Requirements shall be reported. The Semiannual monitoring reports should incorporate available sampling data from other monitoring wells that are in proximity with the treatability study area.

A letter transmitting the self-monitoring reports shall accompany each report. Such a letter shall include a discussion of requirement violations found during the reporting period, and actions taken or planned for correcting noted violations, such as operation or facility modifications. If the Discharger has previously submitted a report describing

corrective actions and/or a time schedule for implementing the corrective actions, reference to the previous correspondence will be satisfactory. The transmittal letter shall contain the penalty of perjury statement by the Discharger, or by the Discharger's authorized agent, as described in the Standard Provisions General Reporting Requirements Section B.3.

2. Response to a Release (Corrective Action Workplan)

If the Discharger determines that the baseline concentrations have been exceeded in any compliance monitoring wells for any constituent of concern or monitoring parameter listed in the Tables 1 and 2, the Discharger shall immediately notify the Regional Board verbally as to the Monitoring Point(s) and constituent(s) or parameter(s) involved, shall provide written notification by certified mail within seven days of such determination. If the Discharger confirms that baseline concentrations have been exceeded in any of the compliance monitoring wells and it has been determined by Regional Board staff that potassium permanganate injection is not providing adequate remediation of VOCs or the amendments and/or by products are migrating outside of the transition zone, the Discharger shall submit a Corrective Action Workplan for approval by the Executive Officer and implement response actions as required in Order No. R5-2007-XXXX.

3. Submittal Dates Semiannual Groundwater Monitoring Reports

Reporting Type	Sampling Frequency and Data Reported	Reporting Period	Report Date Due
Semi-annual	Quarterly, Semi-annual, Annual	1 August – 31 January 1 February – 31 July	15 March 15 September

C. GROUNDWATER MONITORING

Monitoring of the ISCO treatability study shall consist of collecting groundwater samples from monitoring wells designated as treatment zone, transition zone and compliance monitoring wells during both Phase I and Phase II of the ISCO treatability study project. The treatment zone monitoring wells are as follows: 05C002MW, 32C025MW, 32C004MW, 32C024MW, 32C042MW, 32C040MW, 32C038MW, 32C037MW, 32C039MW, 32C036MW, 32M001MW and 32M002MW. The transition zone monitoring wells are as follows: 05L001MW, 32C041MW, 32M003MW and 05C005MW. The compliance monitoring wells are as follows: 05R001MW, 32C026IW, 32R002MW and 32027EW.

Baseline Sampling

In order to obtain an accurate representation of baseline groundwater conditions at Site 32 groundwater monitoring wells in the treatment and transition zones and the compliance monitoring wells, shall be sampled according to Table 1.

Table 1 – Baseline Groundwater Monitoring		
<u>Parameters</u>	<u>Units</u>	<u>Frequency</u>
<u>Field Parameters</u>		
Temperature	°C	once ¹
Specific Conductance	µmhos/cm	once
ORP	millivolts	once
pH	pH number	once
<u>Monitoring Parameters</u>		
Total Dissolved Solids ²	mg/L	once
Volatile Organic Compounds ³	µg/L	once
Dissolved Chromium ⁴	mg/L	once
Dissolved Manganese ⁵	mg/L	once
Potassium ⁶	mg/L	once
Chlorides ⁷	mg/L	once
Dissolved Selenium ⁸	mg/L	once

¹ Samples shall be collected once prior to injection of potassium permanganate, at least one week prior to injection.

² Total Dissolved Solids by EPA Method 160.2, or equivalent.

³ Volatile Organic Compounds by EPA Method 8260, or equivalent, with a Practical Quantitation Limit no greater than 0.5 µg/L.

⁴ Dissolved Chromium by EPA Method 6010B, or equivalent, with a Practical Quantitation Limit no greater than 10 µg/L.

⁵ Dissolved Manganese by EPA Method 6010B, or equivalent, with a Practical Quantitation Limit no greater than 10 µg/L.

⁶ Total Potassium EPA Method 6010B, or equivalent, with a Practical Quantitation Limit no greater than 1000 µg/L.

⁷ Total Chlorides by EPA Method E300.1, or equivalent, with a Practical Quantitation Limit no greater than 5 µg/L.

⁸ Dissolved Selenium by EPA Method 6010B, or equivalent, with a Practical Quantitation Limit no greater than 5 µg/L.

Phase I and II Treatability Study

Monitoring well samples shall be analyzed according to Table 2 during Phase I and II of the ISCO treatability study. The following ISCO treatability study monitoring wells 05C002MW, 32C025MW, 32C042MW, 32C040MW, 32C038MW, 32C037MW, 32C039MW, 32C036MW, 32M001MW, 05L001MW, 32C041MW, 32M003MW, 05C005MW; and compliance monitoring wells 05R001MW, 32C026IW, 32R002MW, 05R002MW and 32027EW should be sampled as described below. The samples will be analyzed for total chromium except as noted below. All chromium present is expected to be in the hexavalent state.

Table 2 – Treatability Study Groundwater Monitoring		
<u>Parameters</u>	<u>Units</u>	<u>Frequency</u>
<u>Field Parameters</u>		
Temperature	°C	Quarterly ^{a,b,c}
Specific Conductance	µmhos/cm	Quarterly ^{a,b,c}
ORP	millivolts	Quarterly ^{a,b,c}
pH	pH number	Quarterly ^{a,b,c}
Groundwater Elevation	ft and hundredths.-MSL	Quarterly ^{a,b,c}
Dissolved Oxygen	mg/L	Quarterly ^{a,b,c}
<u>Monitoring Parameters</u>		
Total Dissolved Solids ¹	mg/L	Quarterly ^{a,b,c}
Permanganate ²	mg/L	Quarterly ^{a,b} /Semi-Annual ^c
Volatile Organic Compounds ³	µg/L	Quarterly ^{a,b} /Semi – Annual ^c
Dissolved Chromium ⁴	mg/L	Quarterly ^{a,b,c}
Dissolved Manganese ⁵	mg/L	Quarterly ^{a,b,c}
Total Potassium ⁶	mg/L	Quarterly ^{a,b,c}
Total Chlorides ⁷	mg/L	Quarterly ^{a,b,c}
Dissolved Selenium ⁸	mg/L	Quarterly ^{a,b,c}

^a Treatment zone monitoring wells: 05C002MW, 32C025MW, 32C042MW, 32C040MW, 32C038MW, 32C037MW, 32C039MW, 32C036MW, 32M001MW (Note: All treatment zone monitoring wells to be sampled quarterly except for 05C002MW, which will be sampled annually for Dissolved Chromium and VOCs)

^b Transition zone monitoring wells 05L001MW, 32C041MW, 32M003MW, 05C005MW (Note: All Transition zone monitoring wells to be sampled quarterly/semiannually except 05L001MW to be sampled annually as noted above)

^c Compliance monitoring wells 05R001MW, 05R002MW, 32C026IW and 32027EW and 32R002MW (Note: All compliance monitoring wells to be sampled quarterly except 05R001MW to be sampled annually as noted above)

- ¹ Total Dissolved Solids by EPA Method 160, or equivalent.
- ² Permanganate by colorimetric Ag SOI SOP V1.3.³ Volatile Organic Compounds by EPA Method 8260, or equivalent, with a Practical Quantitation Limit no greater than 0.5 µg/L.
- ⁴ Dissolved Chromium by EPA Method 6010B, or equivalent, with a Practical Quantitation Limit no greater than 10 µg/L.
- ⁵ Dissolved Manganese by EPA Method 6010B, or equivalent, with a Practical Quantitation Limit no greater than 10 µg/L.
- ⁶ Total Potassium EPA Method , or equivalent, with a Practical Quantitation Limit no greater than 1000 µg/L.
- ⁷ Total Chlorides by EPA Method 6010B, or equivalent, with a Practical Quantitation Limit no greater than 5 µg/L.
- ⁸ Dissolved Selenium by EPA Method 6010B, or equivalent, with a Practical Quantitation Limit no greater than 5 µg/L.

Field testing instruments (such as those used to test oxidation-reduction potential and dissolved oxygen) may be used provided that:

1. The operator is trained in proper use and maintenance of the instruments;
2. The instruments are field calibrated prior to each monitoring event;
3. Instruments are serviced and/or calibrated by the manufacturer at the recommended frequency; and
4. Field calibration reports are provided with the appropriate monitoring report.

The Discharger shall implement the above monitoring program as of the date of the Order.

Ordered by: _____
PAMELA C. CREEDON, Executive Officer

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